ABSTRACT

The Evaluation of anti streptococcus mutans properties of resin composites containing silver nanoparticles

Background and Objectives: Secondary caries is one of the main problems occurring next to the restorations.one of the solutions of preventing secondary caries is to prevent growth of dental biofilm. studies shows that resin composites are more susceptible to aggregation of biofilm than amalgams and glass ionomers and have lesser antibacterial effects that the latter increase the rate of secondary caries itself. Therefore, production of antibacterial resin composites was always under investigation. Thus, the aim of this study is evaluating the efficacy of resin composites containing silver nanoparticles against the Streptococcus Mutans.

Methods: In this experimental study, the antibacterial properties of resin composites incorporating 0, 0/02, 0/03, 0/04, 0/05% w/w of nano silver particles was investigated using turbidity(spectrophotometry) test. composites was formed on the walls of 400 ml micro plates and after the curing, they left in contact with bacterial suspension. In times of 3, 24 and 48 hour, the optical density of the broth was read by spectrophotometer. The data was analyzed by kolomograph-smirnov, one-way ANOVA, LSD test and repeated measure ANOVA.

Results: The results showed that all composites containing silver nanoparticles had antibacterial effects ($p \leq 0/05$) and by increasing the amount of silver nanoparticles to 0/03% w/w, the anti-bactericidal effect rose and the bacterial growth significantly diminished (p=001).However, in higher concentrations than 0/03%, this effect decreased .The MBC (minimum bactericidal concentration) were seen in composites with 2 percent of silver nanoparticles.

Conclusion: While all composite groups containing silver nanoparticles had antibacterial effect, the most efficient group was 0/03% w/w and by increasing the amount of silver nanoparticles, the antibacterial effect didn't increase necessarily.

Keywords: Silver nanoparticles, *streptococcus mutans*, resin copmposites